

### VI.5.3C-RRS PROGRAM FCST RIVER, RESERVOIR AND SNOW FUNCTION (RRS)

#### Purpose

Function RRS is a preprocessor Function that creates time series from variably spaced river, reservoir and snow data.

The time series are used by the Forecast Function (FCEXEC - see Section VI.5.3C-FCEXEC [[Hyperlink](#)]).

The RRS data stored in the Preprocessor Data Base are converted using information stored in the Preprocessor Parametric Data Base and written to the Processed Data Base.

Function RRS processes one station and data type at a time until all data types for all stations are processed. The starting and ending dates are specified by the user. The time step of the time series, whether the time series are allowed to contain missing values, and other information is specified when the station is defined by the Preprocessor Initialization Program (PPINIT - see Section VI.3.3 [[Hyperlink](#)]).

Different methods are used to convert the data to time series depending on whether or not missing data are allowed. The specification of whether missing data are allowed depends on the use of the time series within Function FCEXEC. If missing data are allowed, time series values are only defined for a time step when observations lie within one half of a time interval about the time step for instantaneous data and within the entire time interval for mean data. For instantaneous data, if there are multiple observations within the time interval, linear interpolation is used to define the value at the time step. For mean data, the value is the sum of the observed values weighted by the portions of the time interval they span. For those time series that cannot contain missing data, Function RRS interpolates between observations using either linear interpolation or retention of the old values until a new value is reached. For extrapolation beyond the last observation a recession factor is applied to the last observed value.

For mean outflows from a reservoir, Function RRS contains the capability to distribute reported values to simulate a 'power wave'. The controls for this option, including the shape of the wave, are specified by the user through the PPINIT program.

The RRS Preprocessor must run for at least a 24 hour period. It will always begin at the start of a hydrologic day and finish at the end of a hydrologic day.

A technical description of Function RRS is in Chapter II.8-OFS-RRS [[Hyperlink](#)].

## HCL Input

Input to Function RRS is through the Hydrologic Command Language (HCL).

The input consists of Techniques and their Arguments (see Section VI.5.3C-RRS-TECH [[Hyperlink](#)]) and run time modifications (see Section VI.5.3C-RRS-MOD [[Hyperlink](#)]).

## Sample HCL Input

The following sample HCL input is for typical RRS runs. In these examples, it is assumed that no local defaults are defined (i.e., only the global defaults exist).

### Example 1. Compute RRS

The following example will produce RRS time series but will not print any observed or time series data. The default values for the Techniques STARTRUN, ENDRUN and LSTCMPDY will be used as no dates are specified.

```
@COMPUTE RRS
@STOP
```

### Example 2. Compute RRS with options

The following example will produce RRS time series starting 2 days before today and end 5 days into the future. Observed data are available through today at 6 pm EST. All observed data will be printed. Time series will be printed for reservoir data.

```
@SETOPTIONS
STARTRUN *-02
ENDRUN   *+05
LSTCMPDY *18EST
RRSRESTS(1)
RRSALLOB(1)
@COMPUTE RRS
@STOP
```

### Example 3. Compute RRS with option and Run-Time MODS

The following example will produce RRS time series for the default run period. Only observed data will be printed. The observed discharge data will be set to missing for station Potomac for the period specified, and the observed stage data for station James will be set to missing for the hour specified. Note the '\*' date format cannot be used in the RRSMSNG MOD.

```
@SETOPTIONS
RRSALLOB(1)
MOD
.RRSMSNG
```

```
POTOMAC QIN 122782 122982
JAMES STG 12288306
ENDMOD
@COMPUTE RRS
@STOP
```

### Output

There are two types of output from Function RRS. The first is the printer output. The second output is time series data written to the Processed Data Base.

### Error Messages

The error messages printed by Function RRS Function are listed in Section VI.5.3C-RRS-ERROR [[Hyperlink](#)].